

CLAIMS

1. An antenna device comprising:

a first antenna which is matched with first, second, and third frequency bands;

a second antenna which is matched with the third frequency band;

a diplexer which distributes signals received from the first antenna into signals of the first frequency band and signals of the second and third frequency bands;

a first switch unit which selects a first transmitter for transmitting signals of the first frequency band or a first receiver for receiving signals of the first frequency band, and connects the selected one to the diplexer;

a second switch unit which selects a second receiver for receiving signals of the second frequency band or a second transmitter for transmitting signals of the second frequency band, and connects the selected one to the diplexer; and

a third switch unit which selects the second antenna or diplexer, and connects the selected one to a transmitter/receiver for transmitting and receiving signals of the third frequency band.

2. The antenna device as set forth in claim 1, further comprising an antenna switching connector which is provided between the first antenna and the diplexer,

wherein when an external antenna is attached, the antenna switching connector connects the external antenna to the diplexer instead of the first antenna.

3. The antenna device as set forth in claim 1, further comprising a lowpass filter which is provided at least either between the first switch unit and the first transmitter or between the second switch unit and the second transmitter.
4. The antenna device as set forth in any one of claim 1 through claim 3, wherein:
- the signals of the first frequency band are signals of a 900MHz band in a GSM scheme;
 - the signals of the second frequency band are signals of a 1800MHz band in a DCS scheme; and
 - the signals of the third frequency band are signals of a 2GHz band in a WCDMA scheme.
5. The antenna device as set forth in claim 1, wherein:
- the first antenna is further matched with a fourth frequency band;
 - the diplexer distributes the signals into signals of the first frequency band and signals of the second, third, and fourth frequency bands; and
 - the second switch unit selects a second receiver for receiving signals of the second frequency band, a fourth receiver for receiving signals of the fourth frequency band, or a fourth transmitter for transmitting signals of the second or fourth frequency band, and connects the selected one to the diplexer.

6. The antenna device as set forth in claim 5, further comprising an antenna switching connector which is provided between the first antenna and the diplexer,

wherein when an external antenna is attached, the antenna switching connector connects the external antenna to the diplexer instead of the first antenna.

7. The antenna device as set forth in claim 5, further comprising a lowpass filter which is provided at least either between the first switch unit and the first transmitter or between the second switch unit and the fourth transmitter.

8. The antenna device as set forth in any one of claim 5 through claim 7, wherein:

the signals of the first frequency band are signals of a 900MHz band in a GSM scheme;

the signals of the second frequency band are signals of a 1800MHz band in a DCS scheme;

the signals of the third frequency band are signals of a 2GHz band in a WCDMA scheme; and

the signals of the fourth frequency band are signals of a 1900MHz band in a PCS scheme.

9. The antenna device as set forth in claim 2 or claim 6, further comprising a controller which switches the third switch unit so as to connect

the transmitter/receiver to the diplexer, when the controller detects that the external antenna is attached to the antenna switching connector,

wherein signals of the third frequency band are transmitted and received by the external antenna.